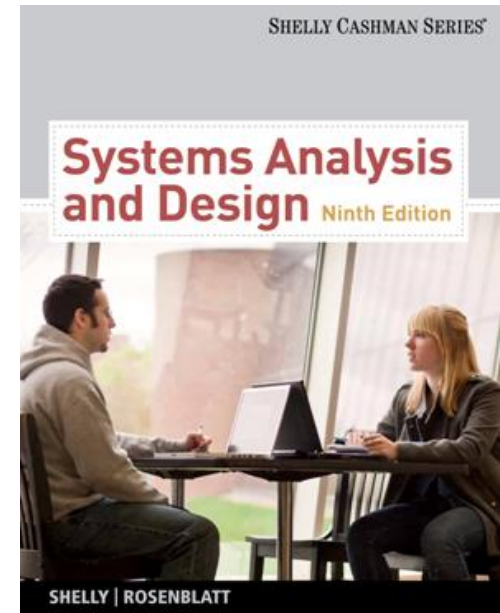


Systems Analysis and Design

9th Edition

Chapter 1

Introduction to Systems Analysis and Design



Chapter Objectives

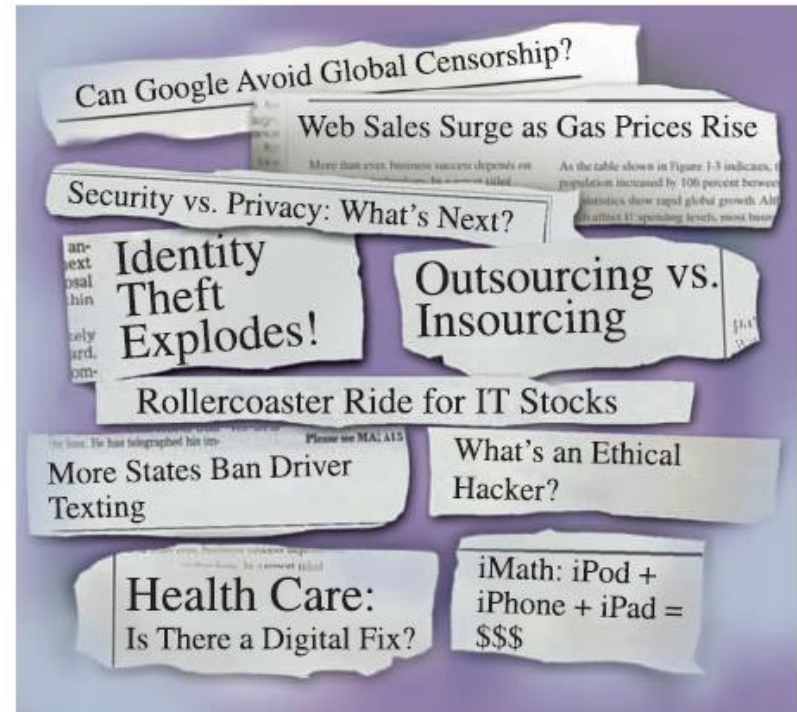
- Discuss the impact of information technology on business strategy and success
- Define an information system and describe its components
- Explain how profiles and models can represent business functions and operations
- Explain how the Internet has affected business strategies and relationships
- Identify various types of information systems and explain who uses them

Chapter Objectives

- Distinguish between structured analysis, object-oriented analysis, and agile methods
- Compare the traditional waterfall model with agile methods and models
- Apply five basic guidelines for systems development
- Discuss the role of the information technology department and the systems analysts who work there

Introduction

- Companies use information as a weapon in the battle to increase productivity, deliver quality products and services, maintain customer loyalty, and make sound decisions
- Information technology can mean the difference between success and failure



The Impact of Information Technology

- Information Technology (IT)
 - Combination of hardware and software products and services that companies use to manage, access, communicate, and share information
- The Future
 - Three issues that will shape the future
 - Changes in world
 - Changes in technology
 - Changes in client demand

The Impact of Information Technology

- Systems Development
 - Business information systems are developed by people who are technically qualified, business-oriented, and highly motivated
 - Must be good communicators with strong analytical and critical thinking skills

The Impact of Information Technology

- Systems Analysis and Design
 - Systems Analysis and Design
 - Step-by-step process for developing high-quality information systems
 - Systems Analyst
 - Plan, develop, and maintain information systems

The Impact of Information Technology

- Who develops Information Systems?
 - In-house applications
 - Software packages
 - Internet-based application services
 - Outsourcing
 - Custom solutions
 - Enterprise-wide software strategies
 - How versus What

Information System Components

- A system is a set of related components that produces specific results
- A Mission-critical system is one that is vital to a company's operations
- Data consists of basic facts that are the system's raw material
- Information is data that has been transformed into output that is valuable to users
- Information systems have five key components: hardware, software, data, processes, and people

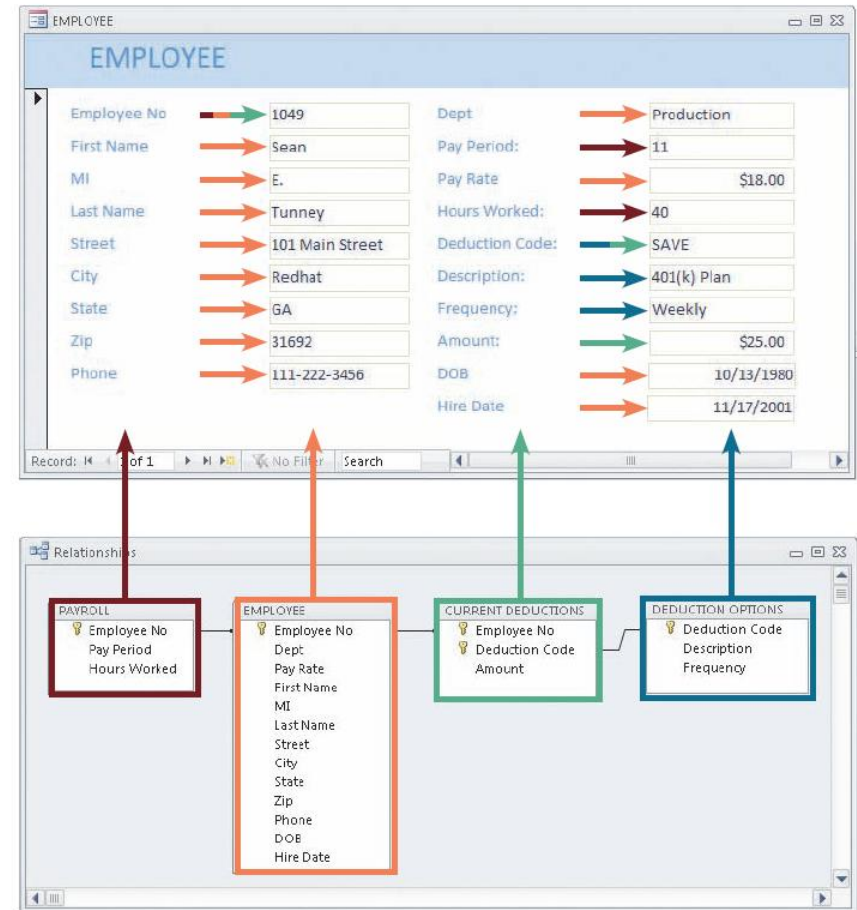
Information System Components

- Hardware
 - Is the physical layer of the information system
 - Moore's Law
- Software
 - System software
 - Application software
 - Enterprise applications

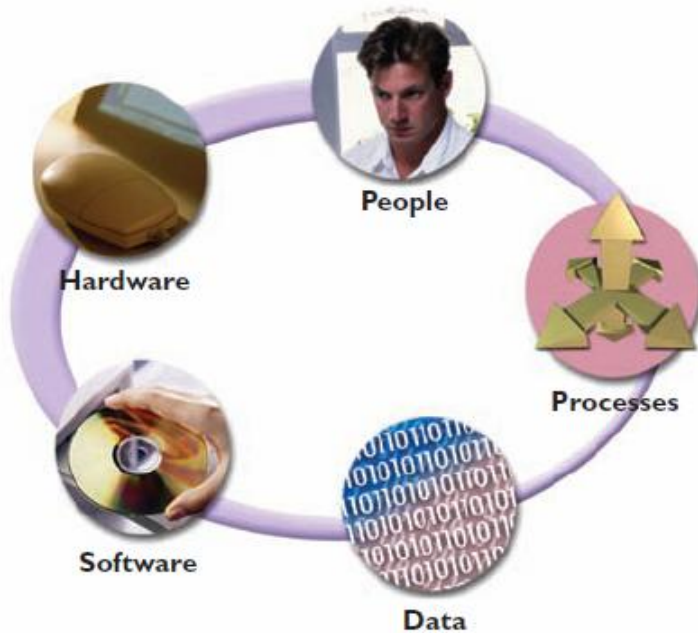


Information System Components

- Software
 - Horizontal system
 - Vertical system
 - Legacy systems
- Data
 - Tables store data
 - Linked tables work together to supply data



Information System Components



- Processes
 - Describe the tasks and business functions that users, managers, and IT staff members perform to achieve specific results
- People
 - Stakeholders
 - Users, or end users

Understanding The Business

- Business Process Modeling
- Business Profile
- Business Models
 - Business model
 - Business process
 - Business process reengineering (BPR)

Understanding The Business

- New Kinds of Companies
 - Production-oriented
 - Service-oriented
 - Internet-dependent
 - Dot-com (.com)
 - Brick-and-mortar



Impact of the Internet

- E-Commerce or I-Commerce
- B2C (Business-to-Consumer)
- B2B (Business-to-Business)
 - EDI
 - Extensible markup language (XML)
 - Supply chain management (SCM)
 - Supplier relationship management (SRM)

Business Information Systems

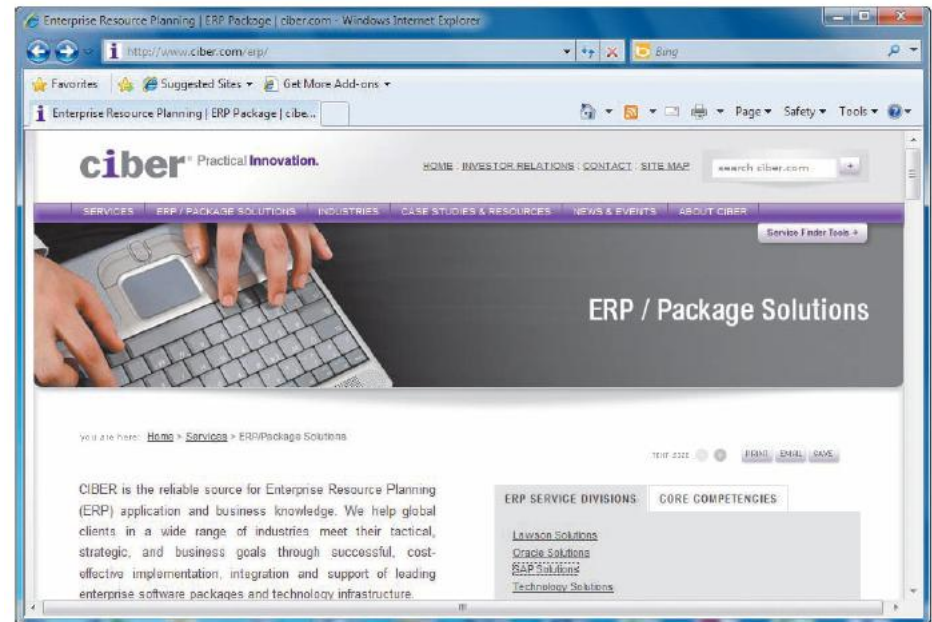
- In the past, IT managers divided systems into categories based on the user group the system served
 - Office systems
 - Operational systems
 - Decision support systems
 - Executive information systems

Business Information Systems

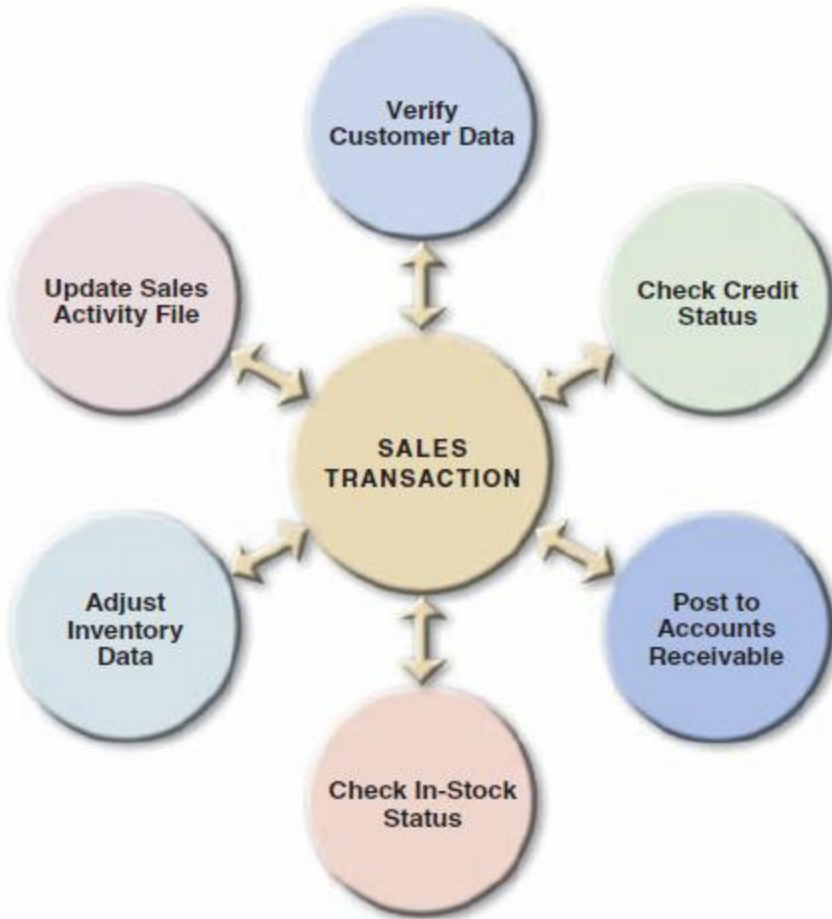
- Today, identify a system by its functions and features, rather than by its users
 - Enterprise computing systems
 - Transaction processing systems
 - Business support systems
 - Knowledge management systems
 - User productivity systems

Business Information Systems

- Enterprise computing systems
 - Support company-wide operations and data management requirements
 - Enterprise resource planning (ERP)
 - Many hardware and software vendors target the enterprise computing market



Business Information Systems



- Transaction processing systems
 - Involve large amounts of data and are mission-critical systems
 - Efficient because they process a set of transaction-related commands as a group rather than individually

Business Information Systems

- Business support systems
 - Provide job-related information to users at all levels of a company
 - Management information systems (MIS)
 - Radio frequency identification (RFID)
 - What-if

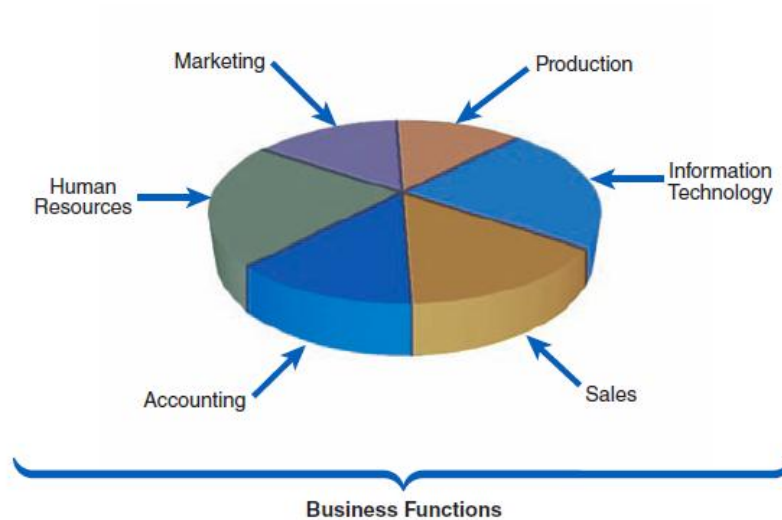
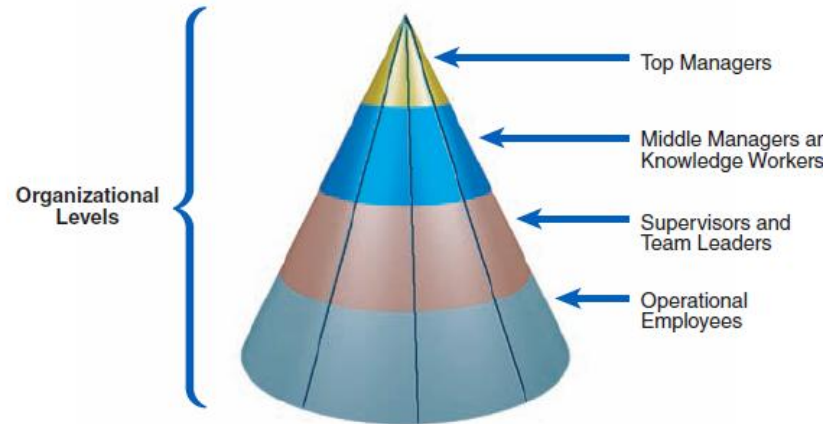
Business Information Systems

- Knowledge management systems
 - Called expert systems
 - Simulate human reasoning by combining a knowledge base and inference rules
 - Many knowledge management systems use a technique called fuzzy logic

Business Information Systems

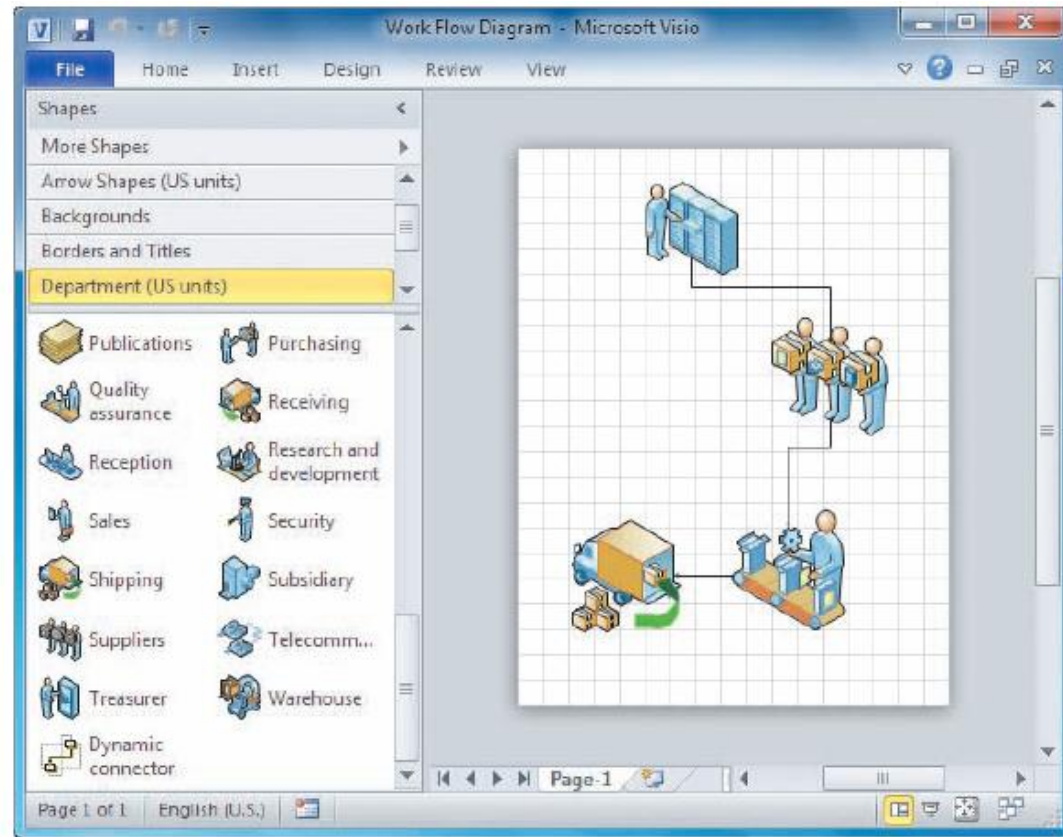
- User productivity systems
 - Technology that improves productivity
 - Groupware
- Information systems integration
 - Most large companies require systems that combine transaction processing, business support, knowledge management, and user productivity features

What Information Do Users Need?



Systems Development Tools

- Modeling
 - Business model
 - Requirements model
 - Data model
 - Object model
 - Network model
 - Process model



Systems Development Tools

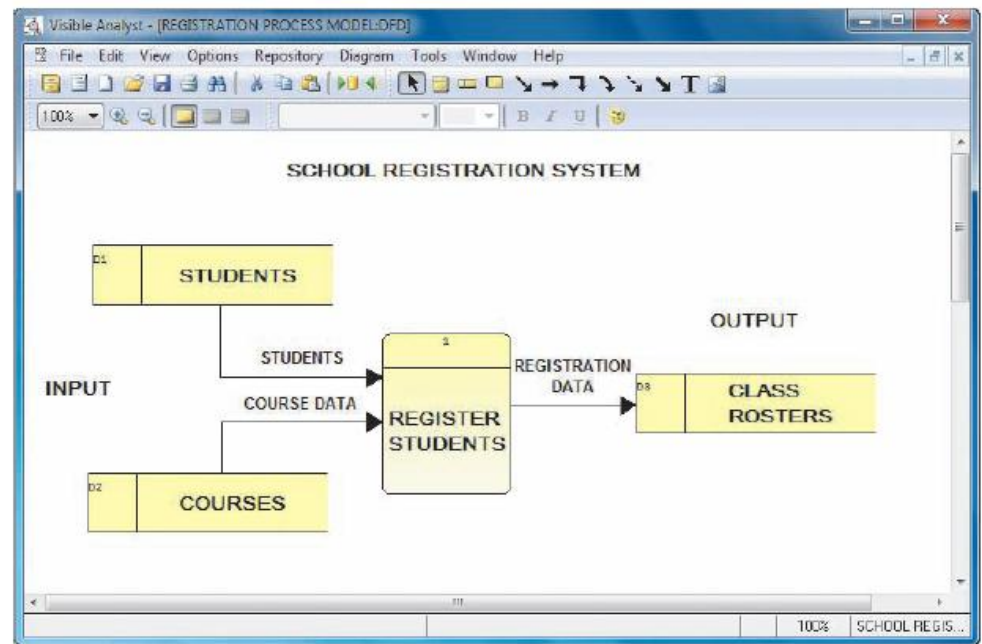
- Prototyping
 - Prototype
 - Speeds up the development process significantly
 - Important decisions might be made too early, before business or IT issues are thoroughly understood
 - Can be an extremely valuable tool

Systems Development Tools

- Computer-Aided Systems Engineering (CASE) Tools
 - Also called computer-aided software engineering
 - CASE tools
 - Can generate program code, which speeds the implementation process

Systems Development Methods

- Structured Analysis
 - Systems development life cycle (SDLC)
 - Predictive approach
 - Uses a set of process models to describe a system graphically
 - Process-centered technique
 - Waterfall model



Systems Development Methods

- Structured Analysis
 - Deliverable or end product
 - Disadvantage in the built-in structure of the SDLC, because the waterfall model does not emphasize interactivity among the phases
 - This criticism can be valid if the SDLC phases are followed too rigidly
 - Adjacent phases usually interact

Systems Development Methods

- Structured Analysis
 - The SDLC model usually includes five steps
 - Systems planning
 - Systems analysis
 - Systems design
 - Systems implementation
 - Systems support and security

Systems Development Methods

- Structured Analysis
 - Systems Planning
 - Systems planning phase
 - Systems request – begins the process & describes problems or desired changes
 - Purpose of this phase is to perform a preliminary investigation
 - Key part of preliminary investigation is a feasibility study

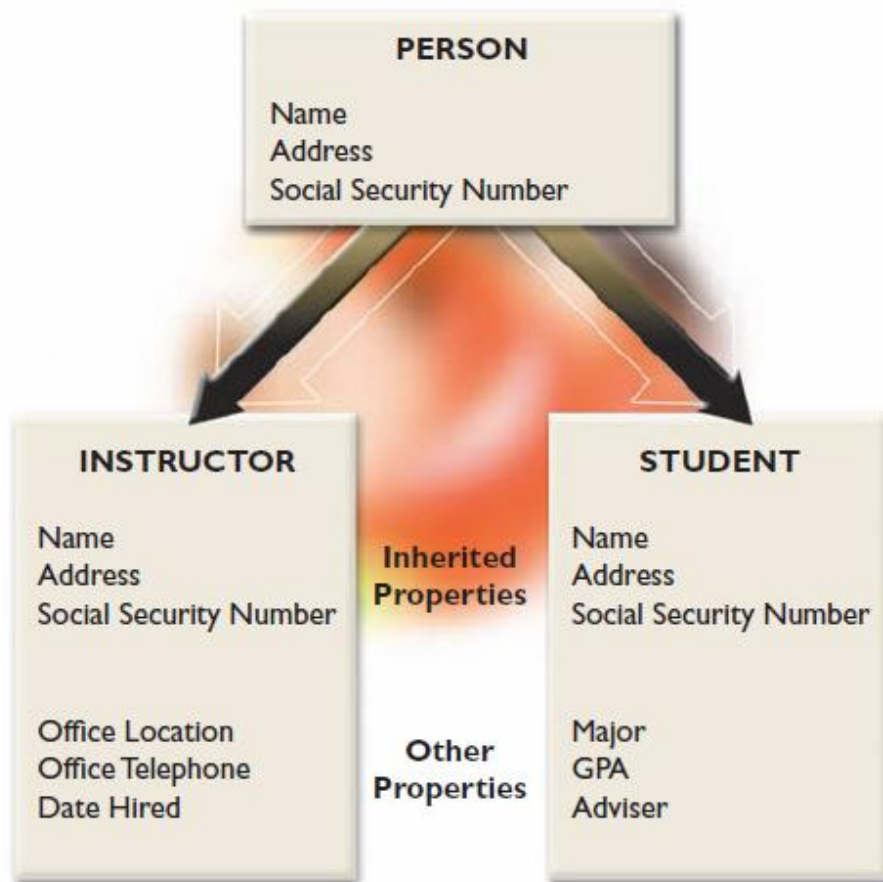
Systems Development Methods

- Structured Analysis
 - Systems Analysis
 - Deliverable is the System requirements document
 - Systems Design
 - Deliverable is system design specification
 - Management and user involvement is critical

Systems Development Methods

- Structured Analysis
 - Systems Implementation
 - New system is constructed
 - Systems Support and Security
 - A well-designed system must be secure, reliable, maintainable, and scalable
 - Most information systems need to be updated significantly or replaced after several years of operation

Systems Development Methods



Object-oriented Analysis

- Combines data & processes that act on the data into things called objects
- Object is a member of a class
- Objects possess properties
- Methods change an object's properties

Systems Development Methods

- Object-Oriented Analysis
 - A message requests specific behavior or information from another object
 - Usually follow a series of analysis and design phases that are similar to the SDLC
 - Interactive model

Systems Development Methods

- Agile Methods
 - Are the newest development
 - Emphasize continuous feedback
 - Iterative development
 - Agile community has published the Agile Manifesto
 - Spiral model

Systems Development Methods

- Agile Methods
 - Agile process determines the end result
 - Other adaptive variations and related methods exist
 - Two examples are Scrum and Extreme Programming (XP)
 - Analysts should understand the pros and cons of any approach before selecting a development method

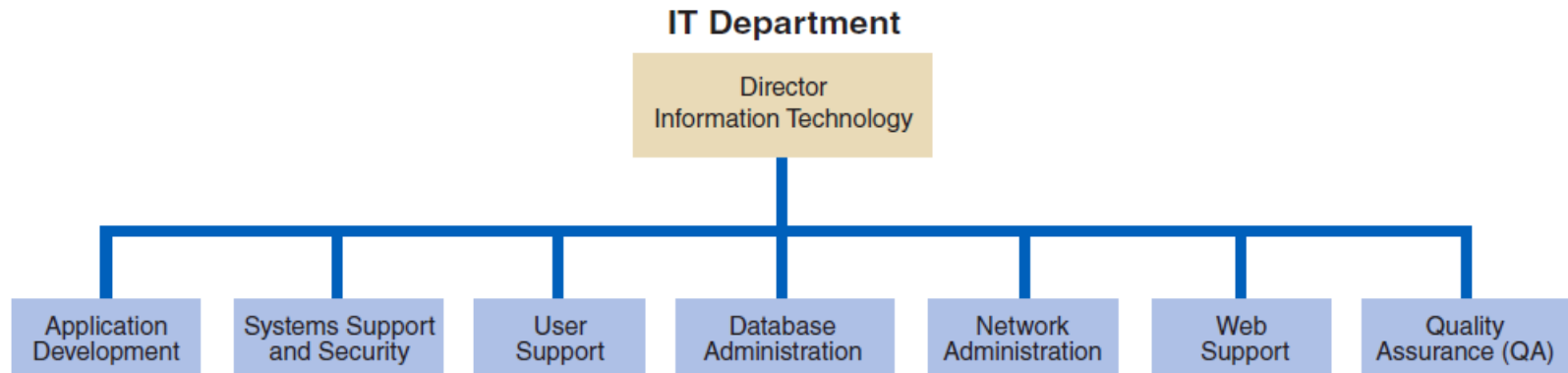
Systems Development Methods

- Other Development Methods
 - Joint application development (JAD)
 - Rapid application development (RAD)
 - Might encounter other systems development techniques
 - Rational Unified Process (RUP®)
 - Microsoft Solutions Framework (MSF)

Systems Development Guidelines

- Develop a project plan
- Involve users and listen carefully to them
- Use project management tools to identify tasks and milestones
- Develop accurate cost and benefit information
- Remain flexible

Information Technology Department



The Systems Analyst

- Responsibilities
 - Translate business requirements into IT projects
- Knowledge, Skills, and Education
 - Needs technical knowledge, strong oral and written communication skills and analytic ability, an understanding of business operations, and critical thinking skills
- Certification
 - Important credential

The Systems Analyst

- Career Opportunities
 - Job titles
 - Company organization
 - Company size
 - Corporate culture
 - Salary, location, and future growth

Chapter Summary

- IT refers to the combination of hardware and software resources that companies use to manage, access, communicate, and share information
- The essential components of an information system are hardware, software, data, processes, and people
- Successful companies offer a mix of products, technical and financial services, consulting, and customer support

Chapter Summary

- Information systems are identified as enterprise computing systems, transaction processing systems, business support systems, knowledge management systems, or user productivity systems
- Organization structure includes top managers, middle managers and knowledge workers, supervisors and team leaders

Chapter Summary

- The IT department develops, maintains and operates a company's information systems
- Systems analysts need a combination of technical and business knowledge, analytical ability, and communication skills
- Systems analysts need to consider salary, location, and future growth potential when making a career decision

Chapter Summary

- Chapter 1 complete